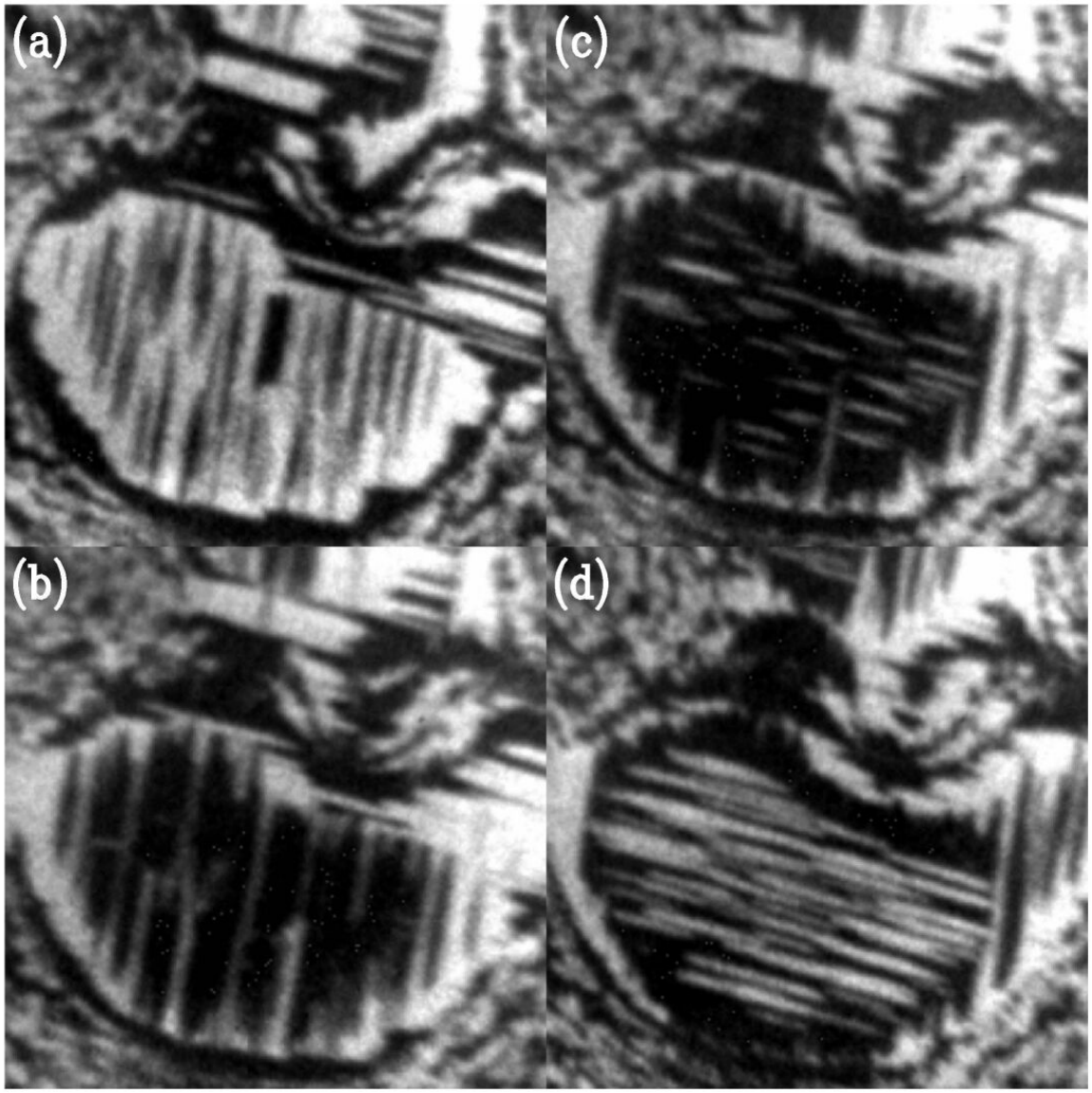
LEEM Study of Indium Etching of Si(001)



- Low-energy electron microscopy has been used to study the adsorption of indium on Si(001) surfaces
- At temperatures below 600°C a variety of indium-related surface structures are found (as previously known)
- Above 600°C, etching of the surface is observed, shown here at 650°C with 10 μm field-of-view images acquired with time spacing of 2 min and with incident indium flux of 6 ML/min.

R. M. Feenstra, DMR-9985898, "Nanoscale Structure of Semiconductor Surfaces, Alloys, and Heterostructures" and DMR-0079416, "Acquisition of a Low-Energy Electron Microscope"

Broader Impact

1. One graduate student graduated, with thesis chapter devoted to LEEM studies of indium on Si(001) and second student beginning LEEM work
2. An laboratory module was developed by Tracy Moore, an undergrad from Allegheny College, dealing with analysis of LEEM data:

- image shows vacancy islands on Si(001) surface, formed by etching surface with oxygen
- using edge detection software developed by J. Hannon, sizes of islands as a function of etching time are determined
- different models are tested for the island growth data
- students arrive at conclusions for growth mechanism